



State of California  
Department of Water Resources

**PROPOSITION 50, CHAPTER 6(a) DESALINATION GRANTS – 2005 FUNDING CYCLE**

**Summaries of Awarded Projects**

(5/25/2005)

Project Category	(Number of Funded Projects / Total Projects)	Project Total Cost (\$)	Requested (\$)	Grant Amount (\$)	State Share to Total Cost (%)
Construction Projects	(3/8)	104,359,043	15,000,000	8,930,744	9%
Pilot and Demonstration Projects	(6/14)	26,438,272	10,474,232	7,974,516	30%
Research and Development	(7/11)	13,804,295	6,004,746	6,004,746	43%
Feasibility Studies	(9/9)	4,437,061	2,089,994	2,089,994	47%
<b>Total</b>	<b>(25/42)</b>	<b>149,038,671</b>	<b>33,568,972</b>	<b>25,000,000</b>	<b>17%</b>

## Water Desalination Construction Projects

(3 projects out of 8 projects)

DWR ID	Applicant	Project Title	Contact Information	Project Cost	\$ Requested	\$ Awarded
032	Marin Municipal Water District	MMWD Desalination Plant	Thomasin G. Curtis, Grant Specialist 220 Nellen Avenue Corte Madera, CA 94925-1169 Tel: 415-945-1542 Fax: 415-927-2630 tcurtis@marinwater.org	\$77,172,043	\$5,000,000	\$3,330,744
034	Inland Empire Utilities Agency	Chino II Desalter Expansion	Rich Atwater, Chief Executive Officer P. O. Box 9020 Chino Hills, CA 91709 Tel: 909-993-1600 Fax: 909-606-7320 atwater@ieua.org	\$17,046,000	\$5,000,000	\$2,800,000
037	Alameda County Water District	Phase 2 Brackish Groundwater Desalination Facility	Paul Piraino, General Manager 43885 S. Grimmer Boulevard Fremont, CA 94538 Tel: 510-668-4201 Fax: 510-770-1793 paul.piraino@acwd.com	\$10,141,000	\$5,000,000	\$2,800,000
<b>Total</b>				<b>\$104,359,043</b>	<b>\$15,000,000</b>	<b>\$8,930,744</b>

### Project Information (DWR ID 032)

Principal Applicant: **Marin Municipal Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Special District**  
☐ (b) other, specify

Project Title: **MMWD Desalination Plant**

Funds requested (dollar amount): **\$ 5,000,000**

Applicant funds pledged (dollar amount): **\$72,172,043**

Total project costs (dollar amount): **\$77,172,043**

Grant awarded (dollar amount): **\$3,330,744**

Life of the project: **> 30 yrs.**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **10,000 AF/yr**

State Assembly District where the project is to be conducted: **6<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **3<sup>rd</sup> Senate District**

Congressional district(s) where the project is to be conducted: **6<sup>th</sup> Congressional District**

County where the project is to be conducted: **Marin**

Location of project (longitude and latitude): **37°57'06.1"N and 122°29'25.0"W**

Project related to: ☐ (a) Construction of a brackish water desalination project  
☒ (b) Construction of a seawater desalination project

### Project Summary

The Marin Municipal Water District (MMWD) Desalination Plant Project involves construction of a 10 MGD desalination facility located on MMWD-owned land in an industrial zone of San Rafael, California. The plant will take water from San Rafael Bay, treat it to drinking water standards and distribute it to MMWD's customers.

The purpose of the project is to provide high-quality, reliable potable water to meet existing and projected water needs in MMWD's service area, including during emergencies and drought conditions. The objective of this project is to design and implement a desalination facility in the most environmentally-responsible manner, while ensuring that it will be cost-effective, protect public health and safety, and fulfill MMWD's service commitments. The project will also optimize the use of existing facilities, complement the district's ongoing conservation and recycling efforts; and allow MMWD to maintain maximum control over its long-term water sources and reduce its dependence on imported water.

### Project Information (DWR ID 034)

Principal Applicant: ***Inland Empire Utilities Agency***

Type of applicant (select one): ☒ (a) public entity, specify: ***Inland Empire Utilities Agency***  
☐ (b) other, specify

Project Title: ***Chino II Desalter Expansion***

Funds requested (dollar amount): ***\$ 5,000,000***

Applicant funds pledged (dollar amount): ***\$12,046,000***

Total project costs (dollar amount): ***\$17,046,000***

Grant awarded (dollar amount): ***\$2,800,000***

Life of the project: ***> 40 yrs.***

Estimated annual amount of water to be produced (in acre-feet) if applicable: ***add 4,400 AFY for a total of 15,600 AFY***

State Assembly District where the project is to be conducted: ***56, 59-63, 65-72***

State Senate District where the project is to be conducted: ***29-35, 37***

Congressional district(s) where the project is to be conducted: ***26, 38-44, 46-49***

County where the project is to be conducted: ***San Bernardino, Riverside and Orange counties***

Location of project (longitude and latitude): ***Longitude: 117°32'41" W / Latitude: 33°59'48.1" N***

Project related to: ☒ (a) Construction of a brackish water desalination project  
☐ (b) Construction of a seawater desalination project

### Project Summary

The Santa Ana Watershed Project Authority, a Joint Powers Authority for five agencies including Inland Empire Utilities Agency, initiated the Chino II Desalter Project, which includes construction of new groundwater pumping and treatment facilities in order to provide potable water supply to local water users, as well as to help meet some of the basin-wide objectives described in the Optimum Basin Management Program (OBMP). The Chino II Desalter was initiated to provide 10,400 acre-feet per year (AFY) of contracted water deliveries. The Chino II Desalter Expansion will provide an additional 4,400 AFY of water deliveries. Once the Chino II Desalter construction is complete (estimated to continue through March 2005) and the facility is online, construction of the expansion will begin. The Chino II Desalter facility has been designed to easily accommodate the expansion.

### Project Information (DWR ID 037)

Principal Applicant: **Alameda County Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Public Water District**  
☐ (b) other, specify

Project Title: **Phase 2 Brackish Groundwater Desalination Facility**

Funds requested (dollar amount): **\$ 5,000,000**

Applicant funds pledged (dollar amount): **\$5,141,000**

Total project costs (dollar amount): **\$10,141,000**

Grant awarded (dollar amount): **\$2,800,000**

Life of the project: **> 35 yrs.**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **add 5,600 AFY for a total of 11,200 AFY**

State Assembly District where the project is to be conducted: **18**

State Senate District where the project is to be conducted: **10**

Congressional district(s) where the project is to be conducted: **13**

County where the project is to be conducted: **Alameda**

Location of project (longitude and latitude): **N 37° 31' W 122° 01'**

Project related to: ☒ (a) Construction of a brackish water desalination project  
☐ (b) Construction of a seawater desalination project

### Project Summary

The Phase 2 Brackish Groundwater Desalination Facility Project will include doubling the capacity of the existing desalination facility (the Phase 1 desalination facility was designed and constructed with this expansion in mind) and construction of the necessary infrastructure (pipeline and new well) to convey additional untreated brackish groundwater to the expanded desalination facility. The primary objectives of this proposed project are to increase drought-proof water supply for the ACWD from 5 to 10 MGD and to improve the quality of water delivered to the ACWD's current and future customers. These objectives will be measured by the operating capacity of the expanded facility as well as the water quality of the water produced from the plant. The secondary objective for this project includes continued reclamation of the local groundwater basin through pumping of the brackish groundwater with improvements in local groundwater quality to be measured through ACWD's existing groundwater monitoring program.

## Water Desalination Pilots and Demonstration Projects

(6 projects out of 14 projects)

DWR ID	Applicant	Project Title	Contact Information	Project Cost	\$ Requested	\$ Awarded
005	Board of Water Commissioners of the City of Long Beach	Under Ocean Floor Seawater Intake and Discharge Demonstration Project	Robert Cheng, Director of Operations Long Beach Water Department 1800 E. Wardlow Road Long Beach, CA 90807 Tel: 562-570-2487 Fax: 562-570-2330 Robert_C_Cheng@lbwater.org	\$5,180,000.00	\$2,500,000	\$2,000,000
012	Coachella Valley Water District	Coachella Valley Groundwater Desalination Project	Mark Beuhler Assistant General Manager P.O. Box 85-995 Avenue 52 Coachella, CA 92236 Tel: 760-398-2651 Fax: 760-398-3711 mbeuhler@cvwd.org	\$1,193,830.00	\$596,915	\$596,915
022	Eastern Municipal Water District	Desalination Recovery Enhancement and Concentrate Management Study	P. Ravishanker Assistant General Manager P.O. Box 8300, Perris, CA 92572-8300 Tel: 951-928-6161 Fax: 951-928-6120 ravishankerp@emwd.org	\$790,000.00	\$395,000	\$395,000
028	West Basin Municipal Water District	Demonstration of Integrated Membrane Seawater Desalination Using Single-Pass RO for the Los Angeles Region	Paul Shoenberger Chief of Engineering and Operations 17140 S. Avalon Boulevard, Suite 210 Carson, CA 90746 Tel: 310-660-6238 Fax: 310-217-2414 Pauls@wcbwater.org	\$10,213,435.00	\$2,499,716	\$1,500,000
029	City of Santa Cruz	Test Technology Innovations and Optimize Systems in the City of Santa Cruz Desalination Pilot Plant	Linette Almond, PE Deputy Water Director 809 Center Street, Room 102 Santa Cruz, CA 95060 Tel: 831-420-5200 Fax: 831-420-5201 lalmond@ci.santa-cruz.ca.us	\$3,971,007.00	\$1,982,601	\$1,982,601
031	City of San Diego	San Pasqual Brackish Groundwater Desalination Project - Phase III	Robert McCollough Water Res. Specialist 600 B Street, Suite 6300 San Diego, CA 92101 Tel: 619-533-4222 Fax: 619-533-5325 Rmccullough@sandiego.gov	\$5,090,000.00	\$2,500,000	\$1,500,000
<b>Total</b>				<b>\$26,438,272.00</b>	<b>\$10,474,232.00</b>	<b>\$7,974,516.00</b>

### Project Information (DWR ID 005)

Principal Applicant: **Board of Water Commissioners of the City of Long Beach**

Type of applicant (select one): ☒ (a) public entity, specify: **Water Department**  
☐ (b) other, specify

Project Title: **Under Ocean Floor Seawater Intake and Discharge Demonstration Project**

Funds requested (dollar amount): **\$2,500,000**

Applicant funds pledged (dollar amount): **\$2,680,000**

Total project costs (dollar amount): **\$5,180,000**

Grant awarded (dollar amount): **\$2,000,000**

Life of the project: **36 months**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **54th Assembly District**

State Senate District where the project is to be conducted: **27th State Senate District**

Congressional district(s) where the project is to be conducted: **37th Congressional District**

County where the project is to be conducted: **Los Angeles County**

Location of project (longitude and latitude): **-118.11028 longitude / 33.75278 latitude**

Project related to: ☒ (a) Brackish water desalination pilot and demonstration project  
☐ (b) Seawater desalination pilot and demonstration project

### Project Summary

The goal of the project is to demonstrate a novel submerged intake and discharge system utilizing an innovative under ocean floor seawater intake and discharge concept. The proposed concept offers a viable method of pretreatment while also posing minimal environmental impacts. While existing submerged intakes, e.g. beach wells, offer numerous benefits over traditional open ocean intakes, they have several limitations, including capital cost, which typically makes them unfavorable except for very small plants. Thus, this project demonstrates that viable, environmentally responsive intake and discharge systems can be developed along the coast of California. Similar to existing submerged intake/discharge designs, the proposed under ocean floor seawater intake utilizes beach sand to pre-filter the ocean water to meet pretreatment requirements for downstream NF2 and RO seawater desalination processes. The design information, water quality data, and performance of the under ocean floor seawater intake/discharge system could serve as a basis for future submerged seawater intake designs along the coast, particularly those facilities considering open ocean intakes and/or co-location. The success of this project could potentially make seawater desalination more economically feasible and environmentally responsible, thus incorporating seawater as viable and cost effective component of the State of California's water supply.

### Project Information (DWR ID 012)

Principal Applicant: **Coachella Valley Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Water District**  
☐ (b) other, specify

Project Title: **Coachella Valley Groundwater Desalination Project**

Funds requested (dollar amount): **\$596,915**

Applicant funds pledged (dollar amount): **\$596,915**

Total project costs (dollar amount): **\$1,193,830**

Grant awarded (dollar amount): **\$596,915**

Life of the project: **2 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **83 (during 9 months of operation, to be disposed of)**

State Assembly District where the project is to be conducted: **80<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **40<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **51<sup>st</sup> Congressional District**

County where the project is to be conducted: **Imperial County**

Location of project (longitude and latitude): **33° 35' 27.33" N 116° 7' 18.03" W**

Project related to: ☒ (a) Brackish water desalination pilot and demonstration project  
☐ (b) Seawater desalination pilot and demonstration project

### Project Summary

It is both relevant and important to California's water future that innovative technologies be supported and implemented to leverage our limited water supplies in an environmentally sustainable fashion. Through this project the Coachella Valley Water District (CVWD) will achieve several important local, regional, state and national objectives. This project will demonstrate the effectiveness of innovative desalination of brackish groundwater, which is comprised mainly of agricultural drainage water. The project will demonstrate an innovative low energy intensity, brackish water, solar still desalination technology in California; evaluate performance of the technology compared to conventional reverse osmosis; assess bank filtration pretreatment as a means of reducing RO costs; assess generated brine volumes and disposal options; and determine the economics of recovering this water resource and complete a feasibility study for full-scale implementation. Operating regimes that minimize treatment costs will be assessed. Additionally, a conceptual assessment of brine disposal options will be conducted including evaporation pond development.



## Project Information (DWR ID 022)

Principal Applicant: **Eastern Municipal Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Special District**  
☐ (b) other, specify

Project Title: **Desalination Recovery Enhancement and Concentrate Management Study**

Funds requested (dollar amount): **\$395,000**

Applicant funds pledged (dollar amount): **\$395,000**

Total project costs (dollar amount): **\$790,000**

Grant awarded (dollar amount): **\$395,000**

Life of the project: **2 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **Assembly Districts 63, 64, 65, 66, 80**

State Senate District where the project is to be conducted: **State Senate Districts 36, 37**

Congressional district(s) where the project is to be conducted: **Congressional Districts 41, 44, 45, 49**

County where the project is to be conducted: **Riverside County**

Location of project (longitude and latitude): **-117.20 longitude / 33.68 latitude**

Project related to: ☒ (a) Brackish water desalination pilot and demonstration project  
☐ (b) Seawater desalination pilot and demonstration project

## Project Summary

This project consists of a pilot-testing program to determine the feasibility of implementing two innovative desalination alternatives that will treat brine generated from Menifee Basin groundwater, while maximizing water recovery and reducing the cost of waste brine management. The effectiveness of chemical precipitation followed by either secondary electro dialysis reversal (EDR) or reverse osmosis (RO) processes will be examined to treat brine from a primary RO system, to optimize the overall water recovery of the desalination process.

EMWD's Menifee Desalters treat a challenging groundwater with a TDS of around 2,500 mg/L and high concentrations of silica (60 mg/L), calcium (331 mg/L), sulfates (430 mg/L), iron (0.3 mg/L) and barium (0.13 mg/L). The desalters currently achieve only about 70 percent recovery due primarily to the high concentrations of silica. EMWD will pilot test an innovative and technologically sound concept, to further treat the concentrate stream at the Menifee desalination plant and thus recover more drinking water from the RO plant. The approach includes the removal of sparingly soluble salts and silica from the RO concentrate in a conventional solids contact clarifier with subsequent treatment using either high pressure RO or EDR. The study integrates the technologies of iron removal, brackish water RO, chemical precipitation, filtration and either high pressure RO or EDR.

### Project Information (DWR ID 028)

Principal Applicant: **West Basin Municipal Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipal Water District**  
☐ (b) other, specify

Project Title: **Demonstration of Integrated Membrane Seawater Desalination using Single-Pass RO for the Los Angeles Region**

Funds requested (dollar amount): **\$2,499,716**

Applicant funds pledged (dollar amount): **\$7,713,719**

Total project costs (dollar amount): **\$10,213,435**

Grant awarded (dollar amount): **\$1,500,000**

Life of the project: **3 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **560 AF/yr**

State Assembly District where the project is to be conducted: **Assembly Districts 42, 47, 51, 52, 53, 54, 55**

State Senate District where the project is to be conducted: **State Senate Districts 23, 25, 26, 28**

Congressional district(s) where the project is to be conducted: **Congressional Districts 30, 33, 35, 36, 37, 46**

County where the project is to be conducted: **Los Angeles**

Location of project (longitude and latitude): **-118.42 / 33.91**

Project related to: ☒ (a) Brackish water desalination pilot and demonstration project  
☐ (b) Seawater desalination pilot and demonstration project

### Project Summary

To further the development of seawater desalination in Southern California, West Basin Municipal Water District (WBMWD) will build a demonstration facility to identify operational and water quality issues using full-scale treatment elements prior to committing to an expensive full-scale facility. The goal of WBMWD's seawater desalination research and development program is to provide the greatest benefit to the industry, identify control solutions for a full-scale system, identify water quality aspects for distribution and discharge, and address permit, regulatory, and political-public questions.

The demonstration facility will advance the development of seawater desalination as a reliable water supply for Southern California in the following notable ways. It will use current membrane pretreatment technologies that have the potential to reduce plant footprint and minimize impacts to the local surroundings versus traditional pretreatment approaches. These same pretreatment technologies have the potential to improve RO membrane cleaning and replacement frequencies. It will use an existing, open-ocean, submerged intake and outfall at a power generating facility, something no major current facility in Southern California utilizes. It will house an education center that will be a focal point for illustrating the issues associated with seawater desalination. It will house a pilot testing bay that will allow the side-by-side testing of a number of new or novel seawater desalination technologies, continuing the assessment of new product developments or operating approaches. It will test the latest energy recovery devices, which can only be operated under larger-scale testing scenarios, but which are critical for determining actual full-scale treatment costs. The project will produce more reliable and accurate cost estimates for treating Pacific Ocean seawater using the technologies.

### Project Information (DWR ID 029)

Principal Applicant: **City of Santa Cruz**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipality**  
☐ (b) other, specify

Project Title: **Test Technology Innovations and Optimize Systems in the City of Santa Cruz Desalination Pilot Plant**

Funds requested (dollar amount): **\$1,982,601**

Applicant funds pledged (dollar amount): **\$1,988,406**

Total project costs (dollar amount): **\$3,971,007**

Grant awarded (dollar amount): **\$1,982,601**

Life of the project: **August 2005 - November 2006**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **27th Assembly District**

State Senate District where the project is to be conducted: **11th State Senate District**

Congressional district(s) where the project is to be conducted: **14th Congressional District**

County where the project is to be conducted: **Santa Cruz County**

Location of project (longitude and latitude): **N 36° 56' 57" / W 122° 03' 53"**

Project related to: ☒ (a) Brackish water desalination pilot and demonstration project  
☐ (b) Seawater desalination pilot and demonstration project

### Project Summary

The pilot study will evaluate optimization of the entire SeaWater Reverse Osmosis (SWRO) process train to determine the most optimal performance, in terms of cost, system reliability, and water quality. There have been few, if any, comprehensive studies evaluating the entire process train. In addition, technology innovations to reduce energy consumption and improve water recovery will be tested, and a new, automated, online method to verify Reverse Osmosis (RO) membrane integrity will be developed. In taking this comprehensive approach, the technologies investigated have the potential to lower the cost of finished water by 20% or more, and could be applicable to many of the 31 desalination plants planned or projected to come on-line in California by 2020. By using brackish water elements in a 2 stage RO system the estimated energy savings are on the order of 15-25% and the estimated water recoveries are as high as 60%. By testing RO rejection of boron, algal toxins, and other emerging contaminants the state will gain important public health information about the fates of these contaminants through the RO process. This information is not currently known. The results will be documented in a detailed report that provides a comparison of design alternatives with the most benefit to those considering SWRO.

### Project Information (DWR ID 031)

Principal Applicant: **City of San Diego**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipality**  
☐ (b) other, specify

Project Title: **San Pasqual Brackish Groundwater Desalination Project - Phase III**

Funds requested (dollar amount): **\$2,500,000**

Applicant funds pledged (dollar amount): **\$2,590,000**

Total project costs (dollar amount): **\$5,090,000**

Grant awarded (dollar amount): **\$1,500,000**

Life of the project: **3 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **500 AFY/Phase III, 5,000/Phase IV**

State Assembly District where the project is to be conducted: **75<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **38<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **50<sup>th</sup> Congressional District**

County where the project is to be conducted: **San Diego**

Location of project (longitude and latitude): **117.40 W Longitude / 33.10 N Latitude**

Project related to: ☒ (a) Brackish water desalination pilot and demonstration project  
☐ (b) Seawater desalination pilot and demonstration project

### Project Summary

The City of San Diego's challenge is to continue to provide residents with a reliable and safe drinking water supply into the future in a cost-effective and environmentally sound manner. To successfully overcome the challenges, the City of San Diego is focusing on the planning and development of its own water supply, including groundwater desalination, to become less reliant on imported water.

When completed, the San Pasqual Brackish Groundwater Desalination Project is expected to produce 5,000 AFY of potable water from the San Pasqual groundwater basin. The Project has four distinct phases. This grant is to support the demonstration phase (Phase III) of the Project.

Phase III will accomplish the step of producing usable potable water from groundwater. The goals of this demonstration project are to: provide an additional 500 AFY of potable water supply to local users; obtain California Department of Health Services approval of the new Groundwater Desalination potable water facility; demonstrate the ability to successfully desalinate groundwater from the San Pasqual Aquifer and meet water quality objectives; and develop plan for future expansion of production and distribution of desalinated groundwater from the San Pasqual Aquifer.

## Water Desalination Research and Development Projects

(7 projects out of 11 projects)

DWR ID	Applicant	Project Title	Contact Information	Project Cost	\$ Requested	\$ Awarded
001	Board of Water Commissioners of the City of Long Beach	Ultraviolet Light and Chlorine Dioxide Seawater Pretreatment Systems for Biogrowth Control and Pathogen Inactivation	Robert C. Cheng, Director of Operations Long Beach Water Department 1800 E. Wardlow Road Long Beach, CA 90807 Tel: 562-570-2487 Fax: 562-570-2330 Robert_C.Cheng@lbwater.org	\$2,000,000.00	\$1,000,000	\$1,000,000
003	Regents of the University of California	UCLA Desalination Research Innovation Project	Kim Duiker, Grant Analyst UCLA Contract and Grant Administration 10920 Wilshire Boulevard, #1200 Los Angeles, CA 90024-1406 Tel: 310-794-0165 Fax: 310-794-0631 kduiker@resadmin.ucla.edu	\$2,678,853.00	\$1,000,000	\$1,000,000
008	Calleguas Municipal Water District	Study of Low Concentration Metals Removal from Brine	Ms. Kristine McCaffrey, P. E. 2100 Olsen Road Thousand Oaks, CA 91360 Tel: 805-526-9323 Fax: 805-579-7173 KMccaffrey@calleguas.com	\$200,000.00	\$100,000	\$100,000
013	Regents of the University of California	Developing a Tool to Guide State and Local Desalination Planning	Brent M. Haddad, Ph. D. (P. I.) Department of Environmental Studies U. C. Santa Cruz Santa Cruz, CA 95064 Tel: 831-459-4149 Fax: 831-459-4015 bhaddad@ucsc.edu	\$2,597,149.00	\$909,051	\$909,051
014	Municipal Water District of Orange County	Horizontal Well Technology Application in Alluvial Marine Aquifers for Ocean Feedwater Supply and Pretreatment	Richard B. Bell, P. E., Project Manager P.O. Box 20895 Fountain Valley, CA 92728 Tel: 714-593-5003 Fax: 714-964-5930 rbell@MWDOC.com	\$2,336,903.00	\$1,000,000	\$1,000,000
020	Lawrence Livermore National Laboratory	Desalination Using Electrostatic Ion Pumping	William L. Bourcier, Ph.D., Environmental Sciences Division L-221 Lawrence Livermore National Laboratory 7000 East Avenue Livermore, CA 94551 Tel: 925-423-3745 Fax: 925-422-7438 bourcier@llnl.gov	\$1,991,390.00	\$995,695	\$995,695
023	Joint Water Reuse & Desalination Task Force (JWR&DTF)	Joint DWR-JwR&DTF Seawater and Brackish Water Research and Development Program	Jeffrey Mosher Director of Research Programs 635 Slaters Lane, 3rd Floor Alexandria, VA 22314 Tel: 703-684-2481 Fax: 703-548-3075 jeffmosher@watereuse.org	\$2,000,000.00	\$1,000,000	\$1,000,000
<b>Total</b>				<b>\$13,804,295.00</b>	<b>\$6,004,746.00</b>	<b>\$6,004,746.00</b>

### Project Information (DWR ID 001)

Principal Applicant: **Board of Water Commissioners of the City of Long Beach**

Type of applicant (select one): ☒ (a) public entity, specify: **Water Department**  
☐ (b) other, specify

Project Title: **Ultraviolet Light and Chlorine Dioxide Seawater Pretreatment Systems for Biogrowth Control and Pathogen Inactivation**

Funds requested (dollar amount): **\$1,000,000**

Applicant funds pledged (dollar amount): **\$1,000,000**

Total project costs (dollar amount): **\$2,000,000**

Grant awarded (dollar amount): **\$1,000,000**

Life of the project: **2 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **54<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **27<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **37<sup>th</sup> Congressional District**

County where the project is to be conducted: **Los Angeles County**

Location of project (longitude and latitude): **-118.11333 Longitude / 33.77639 Latitude**

Project related to: ☒ (a) Brackish water desalination research and development project  
☐ (b) Seawater desalination research and development project

### Project Summary

The goal of the project is to evaluate two pretreatment systems for controlling biofouling in nano-filtration with reverse osmosis (NF/RO) systems and achieving required pathogen disinfection removal credits for implementation at full scale. Success of this project will result in the control of persistent foulants in NF/RO systems while achieving safe water production. It would also result in lower energy costs, use of fewer chemicals, and stable, successful operation of an innovative desalination technology using dual-pass NF membranes.

In particular, the goal of the project is to verify the effectiveness of ultraviolet light (UV) and chlorine dioxide (CIO<sub>2</sub>) in seawater NF/RO desalination systems for achieving the following objectives:

- Prevention/control of biofouling on the membrane surface
- Reduction of degradation of membrane elements
- Reduction in energy consumption by reducing the rate of fouling
- Reduction of chemical consumption.
- The required design and costs for the full-scale implementation

### Project Information (DWR ID 003)

Principal Applicant: **Regents of the University of California**

Type of applicant (select one): ☒ (a) public entity, specify: **University**  
☐ (b) other, specify

Project Title: **UCLA Desalination Research Innovation Project**

Funds requested (dollar amount): **\$1,000,000**

Applicant funds pledged (dollar amount): **\$ 1,678,853**

Total project costs (dollar amount): **\$2,678,853**

Grant awarded (dollar amount): **\$1,000,000**

Life of the project: **3 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **42nd Assembly District**

State Senate District where the project is to be conducted: **23rd State Senate District**

Congressional district(s) where the project is to be conducted: **30th Congressional District**

County where the project is to be conducted: **Los Angeles**

Location of project (longitude and latitude):

Project related to: ☒ (a) Brackish water desalination research and development project  
☐ (b) Seawater desalination research and development project

### Project Summary

The goals of the project are: (1) to provide the scientific understanding and technological basis for the desalination plant of the future, capable of economically and effectively producing potable water from brackish water sources, and (2) to train the next generation of desalination and water treatment professionals who will serve the State of California. These goals will be accomplished through an integrated desalination research and innovation project with the specific objectives being to develop and demonstrate:

1. surface nano-structured fouling-resistant and antimicrobial membranes,
2. hydrodynamic-optimized spiral wound element feed spacers,
3. tailored pretreatment processes for selective foulant removal and scale inhibition,
4. technologies for enhanced water recovery, brine minimization, and concentrate utilization,
5. specifications for a high product water recovery integrated desalination system,
6. rigorous student and professional education programs, and
7. rapid technology transfer and web-based information dissemination.

Major technological innovations that will advance the understanding and performance of membrane desalination in California will be the focus. The key innovation lies in the use of cutting-edge surface nano-structuring techniques that enable more permeable, higher rejecting, and truly fouling-resistant membranes. Integrating this new class of membranes within a process train composed of other advanced technologies such as accelerated seeded-crystallization precipitation and polymer-modified membrane filtration with rapid backpulsing (both technologies already under development at UCLA) will enable more energy efficient, high recovery membrane desalination.

### Project Information (DWR ID 008)

Principal Applicant: **Calleguas Municipal Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipal Water District**  
☐ (b) other, specify

Project Title: **Study of Low Concentration Metals Removal from Brine**

Funds requested (dollar amount): **\$100,000**

Applicant funds pledged (dollar amount): **\$100,000**

Total project costs (dollar amount): **\$200,000**

Grant awarded (dollar amount): **\$100,000**

Life of the project: **June 01 to December 31, 2005**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **Assembly Districts 35, 37, 38**

State Senate District where the project is to be conducted: **State Senate Districts 18, 19**

Congressional district(s) where the project is to be conducted: **Congressional Districts 23, 24**

County where the project is to be conducted: **Ventura, Los Angeles, and Orange Counties**

Location of project (longitude and latitude): **Approx. 34°18'N 118°54'W**

Project related to: ☐ (a) Brackish water desalination research and development project  
☒ (b) Seawater desalination research and development project

### Project Summary

Calleguas is largely dependent on imported water sources, because the local groundwater is not readily usable due to water quality concerns, primarily total dissolved solids (TDS) and other salts. The only way to remove these constituents is through a membrane treatment process, such as reverse osmosis (RO). However, when groundwater is treated with membranes, the reject brine typically contains metals that are concentrated three- to four-fold. The presence of metals at these concentrations complicates management of the brine through normal discharge practices. Cost effective removal of the metals would facilitate discharge of brine through ocean outfalls within California in compliance with the water quality objectives contained in the California Ocean Plan (Ocean Plan), and possibly allow other management alternatives.

This project will evaluate two treatment technologies at the bench scale for their potential to remove metals at low concentrations (micrograms per liter) from brine derived from membrane treatment of groundwater. The removal of these metals is crucial for brine management and disposal and has implications for desalination projects statewide.



### Project Information (DWR ID 013)

Principal Applicant: **Regents of the University of California**

Type of applicant (select one): ☒ (a) public entity, specify: **University**  
☐ (b) other, specify

Project Title: **Developing a Tool to Guide State and local Desalination Planning**

Funds requested (dollar amount): **\$909,051**

Applicant funds pledged (dollar amount): **\$1,688,098**

Total project costs (dollar amount): **\$2,597,149**

Grant awarded (dollar amount): **\$909,051**

Life of the project: **2 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **Assembly Districts: 27, 28, 54, 60, 61, 62, 63**

State Senate District where the project is to be conducted: **State Senate Districts: 15, 25, 27, 29, 31, 32**

Congressional district(s) where the project is to be conducted: **Congressional Districts: 17, 37, 41, 43**

County where the project is to be conducted: **Los Angeles, Monterey, San Bernardino**

Location of project (longitude and latitude):

Project related to: ☒ (a) Brackish water desalination research and development project  
☐ (b) Seawater desalination research and development project

### Project Summary

Today, there exists a need for water agencies to have a consistent and effective approach for comparing alternative water supplies. To address this need, this project will develop an innovative analytical tool for conducting a full social cost accounting-based assessment of the benefits and costs of proposed desalination projects in California.

Benefit-cost analysis is a technique that enables program evaluators to undertake structured comparative analyses of alternative approaches to achieving the same outcome. It is widely used, and in some cases federally-mandated, in evaluating complex projects that have substantial environmental and social impacts. This tool will take the form of a series of templates that systematically list options (including a "no project" base case) and their implications, with clear explanations as to how to apply the templates to specific projects.

Guidance will be provided on how the templates could be used in a larger public policy process that is considering alternative water supply options. The grantee will develop case study illustrations of the benefit-cost framework to (1) help refine and guide the tool's development, (2) demonstrate how the tool can be used to estimate and portray environmental and other costs and benefits of desalination (and other source water alternatives) in an objective and comprehensive manner, and (3) reveal how the benefits of specific desalination projects compare to their costs.

The grantee will further identify where additional primary research is needed to clarify key benefits and costs, and develop and demonstrate new methods as appropriate and feasible. The grantee will disseminate this analytical tool, as well as advice on how it can be integrated into a broader policy process, to California water agencies and to stakeholders from multiple perspectives and interests.

### Project Information (DWR ID 014)

Principal Applicant: **Municipal Water District of Orange County**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipal Water District**  
☐ (b) other, specify

Project Title: **Horizontal Well Technology Application in Alluvial Marine Aquifers for Ocean Feedwater Supply and Pretreatment**

Funds requested (dollar amount): **\$1,000,000**

Applicant funds pledged (dollar amount): **\$1,336,903**

Total project costs (dollar amount): **\$2,336,903**

Grant awarded (dollar amount): **\$1,000,000**

Life of the project: **3 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **73rd Assembly District**

State Senate District where the project is to be conducted: **35th State Senate District**

Congressional district(s) where the project is to be conducted: **48th Congressional District**

County where the project is to be conducted: **Orange County**

Location of project (longitude and latitude): **117-41-01.23331 W / 33-27-50.42610 N**

Project related to: ☒ (a) Brackish water desalination research and development project  
☐ (b) Seawater desalination research and development project

### Project Summary

Municipal Water District of Orange County (MWDOC) project addresses the technical, economical, and institutional feasibility of horizontal well technology in alluvial marine aquifers for ocean feedwater supply and pretreatment.

MWDOC has two primary objectives for this work. The first is to develop cost-effective advancements for combining horizontal well drilling with water well technology appropriate to construction of high-yield subsurface intake systems that can extend outwards up to 2,000 feet into shallow stream deposits that now form alluvial marine aquifers. This approach promises to provide high yield, filtered ocean water, while avoiding marine organism impacts associated with open intake systems, as well as avoiding cone of depression impacts to the freshwater aquifer-coastal dependant riparian habitat as compared to conventional beach well systems. The second is to determine the pretreatment benefits associated with natural well-grades, non-uniform alluvial deposits as compared to uniform sized beach sand deposits, which will be investigated by Long Beach Water Department (LBWD).

### Project Information (DWR ID 020)

Principal Applicant: **Lawrence Livermore National Laboratory**

Type of applicant (select one): ☒ (a) public entity, specify: **Federal Government Laboratory**  
☐ (b) other, specify

Project Title: **Desalination Using Electrostatic Ion Pumping**

Funds requested (dollar amount): **\$995,695**

Applicant funds pledged (dollar amount): **\$995,695**

Total project costs (dollar amount): **\$1,991,390**

Grant awarded (dollar amount): **\$995,695**

Life of the project: **3 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **15<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **9<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **10<sup>th</sup> Congressional District**

County where the project is to be conducted: **Alameda**

Location of project (longitude and latitude): **121.460°W 37.4055°N**

Project related to: ☒ (a) Brackish water desalination research and development project  
☐ (b) Seawater desalination research and development project

### Project Summary

Lawrence Livermore National Laboratory (LLNL) will develop a new desalination technology that they believe will outperform existing technologies: use less energy, have lower capital costs, be less susceptible to fouling, and simpler to operate. The technology uses electrostatic fields to remove salt from water, and does not involve passing water or salt through a membrane. It therefore avoids the irreversible energy loss associated with membrane transport, such as happens during reverse osmosis and electrodialysis. It also takes advantage of the fact that even in sea water there are 50 times more water molecules than salt ions. Thermodynamics clearly favors a process that removes salt from water, rather than water from salt. Reverse osmosis and the common thermal desalination technologies all remove water from salt.

In this proposal, LLNL will demonstrate this technology "Desalination with Electrostatic Ion Pumping (DEIP)" on a laboratory scale, optimize its behavior using first principles modeling combined with laboratory validation, and field test a portable unit at a saline well operated by our Zone 7 Water District partner (TBA). LLNL will acquire performance data on energy use, materials degradation over time, and other key attributes using a range of water salinities (1000-50,000 ppm TDS) over time scales of up to several months of continuous use. At project completion, our intention is to have the technology ready for pilot testing.

### Project Information (DWR ID 023)

Principal Applicant: **Joint Water Reuse & Desalination Task Force (JWR&DTF)**

Type of applicant (select one): ☐ (a) public entity, specify:  
☒ (b) other, specify: **Non-Profit Research Foundation**

Project Title: **Joint DWR-JWR&DTF Seawater and Brackish Water Research and Development Program**

Funds requested (dollar amount): **\$1000,000**

Applicant funds pledged (dollar amount): **\$1000,000**

Total project costs (dollar amount): **\$2000,000**

Grant awarded (dollar amount): **\$1000,000**

Life of the project: **3 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **N/A**

State Senate District where the project is to be conducted: **N/A**

Congressional district(s) where the project is to be conducted: **N/A**

County where the project is to be conducted: **N/A**

Location of project (longitude and latitude): **N/A**

Project related to: ☒ (a) Brackish water desalination research and development project  
☐ (b) Seawater desalination research and development project

### Project Summary

The JWR&DTF is a coalition of national research organizations and federal government partners dedicated to sharing the results of research, engaging in organized planning, and collaborating on research projects focused on water reclamation, reuse, recycling, salinity management, and desalination.

The Joint Water Reuse & Desalination Task Force (JWR&DTF) is proposing a major Research and Development Project under California Department of Water Resources' (DWR) 2004 Water Desalination Proposal Solicitation Package. This *Joint DWR-JWR&DTF Seawater and Brackish Water Research and Development Program* represents a significant opportunity for DWR and the JWR&DTF to co-sponsor projects under a research and development program on seawater and brackish water desalination. The projects will be identified as part of a national effort that will leverage DWR's resources with both financial resources and expertise from across the nation. This proposed project will allow DWR to take advantage of the efforts of the JWR&DTF in identifying, prioritizing, and implementing desalination research and development projects that would have the greatest impact on addressing the research needs of California's desalination community.

The expected outcomes of this project will be a series of research and development projects valued at over \$2 million resulting in a series of research reports published by the JWR&DTF on issues and concerns important to desalination in California and across the nation. It is expected that the results of the projects will be presented at industry conferences and published in peer-reviewed journals.

## Water Desalination Feasibility Studies

(9 projects out of 9 projects)

DWR ID	Applicant	Project Title	Contact Information	Project Cost	\$ Requested	\$ Awarded
006	Western Municipal District	Feasibility Study for the Expansion of the Arlington Desalter	Brenda Meyer P. O. Box 5286, Riverside, CA 92517-5286 Tel: 951-789-5077 Fax: 951-780-3837 bmeyer@wmwd.com	\$595,218.00	\$249,992	\$249,992
007	East Bay Municipal Utility District, on behalf of the Bay Area Regional Desalination Partnership	Bay Area Regional Desalination Project	Hasan M. Abdullah, P. E. Desalination Project Coordinator East bay Municipal Utility District P. O. Box 24055, Oakland, CA 94623 Tel: 510-287-0550 Fax: 510-287-1295 habdulla@ebmud.com	\$499,512.00	\$249,756	\$249,756
015*	East Niles Community Services District	Saline Shallow Groundwater Recovery Project	Joshua T. Nord, District Engineer 5001 E. Commercenter Drive, Suite 100 Bakersfield, CA 93309 Tel: 661-325-7253 Fax: 661-395-0359 jnord@boyleengineering.com	\$249,541.00	\$249,541	\$249,541
016	Montara Water and Sanitary District	Feasibility Study of Brackish Water Desalination	George F. Irving, District Manager 8888 Cabrillo Highway P. O. Box 370131, Montara, CA 94037-0131 Tel: 650-728-3545 Fax: 650-728-8556 msd@montara.com	\$500,000.00	\$250,000	\$250,000
025	The Association of Monterey Bay Governments (AMBAG)	Desalination Feasibility Study in the Monterey Bay Region	Jonathan Berkey P. O. Box 871, Carmel Valley, CA 93924 Tel: 831-659-4574 jonathan.berkey@sbcglobal.net	\$211,970.00	\$100,000	\$100,000
027	West Basin Municipal Water District	Full Scale Seawater Desalination Facility Permitting Requirements in the Santa Monica Bay Area	Paul Shoenberger Chief of Engineering and Operations 17140 S. Avalon Boulevard, Suite 210 Carson, CA 90746 Tel: 310-660-6238 Fax: 310-217-2414 Pauls@wcbwater.org	\$590,820.00	\$246,005	\$246,005
035	San Diego County Water Authority	Feasibility Study for Seawater Desalination at the San Onofre Nuclear Generating Station	Bob Yamada Seawater Desalination Program Manager 4677 Overland Avenue, San Diego, CA 92117 Tel: 858-522-6744 Fax: 858-268-7881 ryamada@sdacwa.org	\$800,000.00	\$250,000	\$250,000
040	City of San Diego	San Diego Formation Brackish G.W. Desalination Project - Phase II	Robert McCollough, Water Res. Specialist 600 B Street, Suite 600, San Diego, CA 92101 Tel: 619-533-4222 Fax: 619-533-5325 RMccollough@sandiego.gov	\$500,000.00	\$249,700	\$249,700
041	San Benito County Water District	Pajaro Watershed Groundwater Desalination Feasibility Study	Jeff Cattaneo, Engineer 30 Mansfield Road P. O. Box 899, Hollister, CA 95024 Tel: 831-637-8218 Fax: 831-637-7267 jcattaneo@sbcwd.com	\$490,000.00	\$245,000	\$245,000
<b>Total</b>				<b>\$4,437,061.00</b>	<b>\$2,089,994.00</b>	<b>\$2,089,994.00</b>

\* Subject to resolving matching fund requirement of the Bond Act with the grantee.

### Project Information (DWR ID 006)

Principal Applicant: **Western Municipal District**

Type of applicant (select one): ☒ (a) public entity, specify: **Special District**  
☐ (b) other, specify

Project Title: **Feasibility Study for the Expansion of the Arlington Desalter**

Funds requested (dollar amount): **\$249,992**

Applicant funds pledged (dollar amount): **\$345,226**

Total project costs (dollar amount): **\$595,218**

Grant awarded (dollar amount): **\$249,992**

Life of the project: **1 year, 3 months**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A (10,000 upon construction)**

State Assembly District where the project is to be conducted: **Assembly Districts: 66, 71**

State Senate District where the project is to be conducted: **State Senate Districts: 31, 37**

Congressional district(s) where the project is to be conducted: **44<sup>th</sup> Congressional District**

County where the project is to be conducted: **Riverside**

Location of project (longitude and latitude): **33° N 53' 46.5" / 117° W 28' 56.5"**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

This feasibility study will evaluate the expansion of the Arlington Desalter extraction and treatment system in Riverside County, California. This Desalter currently supplies approximately 6,000 acre-feet per year (ac-ft/yr) to the City of Norco as potable water and to the Orange County Water District for groundwater recharge. The expansion of the Desalter system would add the facilities (wells, pipelines, and an additional reverse osmosis train with feed pump) to increase production in the Arlington Basin. If additional groundwater withdrawal does not over-draft the aquifer or cause other associated effects, it is expected that up to an additional 4,000 ac-ft/yr of potable water may be produced by the expansion of the Arlington Desalter. This production would be available in all years, including drought periods. The extracted and treated groundwater would serve as a new source of potable water for the Jurupa Community Services District, which currently relies mainly on groundwater from the Chino Basin. This source of potable water is facing many challenges including rapidly increasing demand, adjudicated limits on extraction, and impacts from groundwater contamination.

### Project Information (DWR ID 007)

Principal Applicant: **East Bay Municipal Utility District (EBMUD), on behalf of the Bay Area regional desalination partnership**

Type of applicant (select one): ☒ (a) public entity, specify: **Local Water Agency**

☐ (b) other, specify

Project Title: **Bay Area Regional Desalination Project**

Funds requested (dollar amount): **\$249,756**

Applicant funds pledged (dollar amount): **\$249,756**

Total project costs (dollar amount): **\$499,512**

Grant awarded (dollar amount): **\$249,756**

Life of the project: **1 year**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **Assembly Districts: 11, 12, 14, 15, 16, 18, 20, 21, 22, 23, 24, 27, 28**

State Senate District where the project is to be conducted: **State Senate Districts: 3, 7, 9, 10, 11, 13, 15**

Congressional district(s) where the project is to be conducted: **Congr. Districts: 7, 8, 9, 10, 11, 13, 14, 15, 16, 17**

County where the project is to be conducted: **Alameda, Contra Costa, Santa Clara, and San Francisco**

Location of project (longitude and latitude): **N/A**

Project related to: ☒ (a) Brackish water desalination feasibility study

☒ (b) Seawater desalination feasibility study

### Project Summary

Bay Area Regional Desalination Partnership is a group of four agencies working together to conduct a feasibility study for a Regional Desalination Project (RDP) in the San Francisco Bay Area with the goal to develop desalination as a water supply for the region. The feasibility study would develop a process by which the institutional, physical, environmental, and economic feasibility of the Bay Area RDP can be evaluated and replicated by other water agencies considering desalination.

The goals and objectives of the feasibility study are to:

- Develop a process for evaluating the feasibility of regional collaboration for seawater/brackish water desalination.
- Identify a mechanism (such as a MOU or Joint Powers Authority) that can be implemented by multiple participants in a desalination project and execute an institutional agreement for the RDP.
- Develop and implement a process by which various criteria relevant to desalination projects can be evaluated to select optimal site(s). These criteria would include issues such as physical infrastructure, environmental issues and permitting, and cost. Apply this process to the RDP sites and select a site or sites for detailed evaluation.
- Provide information about the costs and benefits of a centralized regional approach to desalination to the public, other water agencies, and environmental groups.
- Produce a template that can be replicated elsewhere in the state, potentially reducing adverse environmental and socioeconomic effects along the California coast.
- Prepare preliminary site layout for selected RDP site(s) and scope of work for environmental impact analysis of the proposed Bay Area RDP

### Project Information (DWR ID 015)

Principal Applicant: **East Niles Community Services District**

Type of applicant (select one): ☒ (a) public entity, specify: **Community Services District**  
☐ (b) other, specify

Project Title: **Saline Shallow Groundwater Recovery Project**

Funds requested (dollar amount): **\$249,541**

Applicant funds pledged (dollar amount): **\$0 (Disadvantaged community)**

Total project costs (dollar amount): **\$249,541**

Grant awarded (dollar amount): **\$249,541**

Life of the project: **6 months**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A (1,000-3,000 upon construction)**

State Assembly District where the project is to be conducted: **Assembly Districts: 30, 32**

State Senate District where the project is to be conducted: **State Senate Districts: 16, 18**

Congressional district(s) where the project is to be conducted: **22<sup>nd</sup> Congressional District**

County where the project is to be conducted: **Kern**

Location of project (longitude and latitude): **Undetermined**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

Saline Shallow Groundwater Recovery Project will evaluate the feasibility of supplying 1,000 or 3,000 acre-feet per year (AFY) of water by desalinating shallow groundwater on the west side of San Joaquin Valley in Kern County. There currently exist many thousands of acre-feet of this groundwater, with a total dissolved solids concentration ranging from 2,000 mg/L to over 35,000 mg/L. As other studies have demonstrated the technical feasibility of desalting this shallow groundwater, this study will evaluate the financial and institutional feasibility of using this water as a supplemental municipal supply.



### Project Information (DWR ID 016)

Principal Applicant: **Montara Water and Sanitary District**

Type of applicant (select one): ☒ (a) public entity, specify: **Public Water District**  
☐ (b) other, specify

Project Title: **Feasibility Study of Brackish Water Desalination**

Funds requested (dollar amount): **\$250,000**

Applicant funds pledged (dollar amount): **\$250,000**

Total project costs (dollar amount): **\$500,000**

Grant awarded (dollar amount): **\$250,000**

Life of the project: **1 year**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A (1,000-3,000 upon construction)**

State Assembly District where the project is to be conducted: **19<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **8<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **12<sup>th</sup> Congressional District**

County where the project is to be conducted: **San Mateo**

Location of project (longitude and latitude): **Longitude 122° 51' 5" / Latitude 37° 54' 2"**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

Montara Water and Sanitary District (MWSD) provides water to the coastal communities of Montara, Moss Beach, and adjacent areas located north of Half Moon Bay and South Pacifica, in San Mateo County California. This Feasibility Study of Brackish Water Desalination is based on the need to develop new and alternative potable water supplies for the existing service area customers. Historically, the water system has had to deal with the issue of a water supply that barely meets current demands and often requires imposition of mandatory conservation measures to meet warm season demands. The study aims to specifically address the following brackish water desalination issues:

- Determining value and limitations of beach wells for feedwater intake;
- Developing strategies for brine/concentrate management;
- Incorporating opportunities for energy efficiencies and application of alternative energy sources and combined energy and desalination technologies;
- Studying utilization of improved membranes with high salt rejection and less susceptible to scaling and fouling;
- Incorporating an improved desalination process design, to include but not limited to membrane processes and thermal processes; and
- Contributing to other applied research investigations aiming at refining/advancing desalination technology.

### Project Information (DWR ID 025)

Principal Applicant: **The Association of Monterey Bay Governments (AMBAG)**

Type of applicant (select one): ☒ (a) public entity, specify: **Council of Governments**  
☐ (b) other, specify

Project Title: **Desalination Feasibility Study in the Monterey Bay Region**

Funds requested (dollar amount): **\$100,000**

Applicant funds pledged (dollar amount): **\$111,970**

Total project costs (dollar amount): **\$211,970**

Grant awarded (dollar amount): **\$100,000**

Life of the project: **1 year**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **Assembly Districts: 27, 28**

State Senate District where the project is to be conducted: **State Senate Districts: 11, 12, 15**

Congressional district(s) where the project is to be conducted: **Congressional Districts: 14, 17**

County where the project is to be conducted: **Monterey and Santa Cruz**

Location of project (longitude and latitude): **122° 00' W / 36° 00' N**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

The goal of the Desalination Action Plan is to devise a regional framework to minimize or eliminate impacts to the Sanctuary through regional planning, facility siting, development of on-site mitigation measures, modeling and monitoring, and outreach. The overall intent of this project is to develop a regional model to address critical desalination issues through a comprehensive planning process for coastal areas of California.

The first critical step toward a regional planning approach to desalination in the Monterey Bay area is a feasibility study to investigate the environmental, economic, and social impacts of desalination project implementation with the goal to increase knowledge and understanding among the public and related government agencies and organizations in order to facilitate more informed decision-making, and to ensure the optimal production of environmentally, economically, and socially acceptable desalinated water on a regional scale. Specific objectives include:

1. To assess the role of desalination technologies to achieve a dependable water supply for the Monterey Bay region.
2. To gain a better understanding of the technical, design and siting options currently available for desalination plants.
3. To increase education and awareness levels of the public and relevant local agencies on critical issues in adoption of desalination alternatives.

This feasibility study will assess desalination water supply projects in the region, both existing facilities and proposed, with respect to cumulative impacts and identify opportunities for collaboration among projects that to reduce impacts and financial costs, and enhance the potential to reduce the region's vulnerability to future droughts.

### Project Information (DWR ID 027)

Principal Applicant: **West Basin Municipal Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipal Water District**  
☐ (b) other, specify

Project Title: **Full Scale Seawater Desalination Facility Permitting Requirements in the Santa Monica Bay Area**

Funds requested (dollar amount): **\$246,005**

Applicant funds pledged (dollar amount): **\$344,815**

Total project costs (dollar amount): **\$590,820**

Grant awarded (dollar amount): **\$246,005**

Life of the project: **18 months**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **Assembly Districts: 42, 47, 51, 52, 53, 54, 55**

State Senate District where the project is to be conducted: **State Senate Districts: 23, 25, 26, 28**

Congressional district(s) where the project is to be conducted: **Congressional Districts: 30, 33, 35, 36, 37, 46**

County where the project is to be conducted: **Los Angeles**

Location of project (longitude and latitude): **-118.42 / 33.91**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

WBMWD is proposing to construct an Ocean Water Desalination Demonstration Project with the capability of desalting 40 million gallons of water per day. The Demonstration Project is the first step to further research and development of ocean-water desalination treatment processes. With the knowledge gained by operating the Demonstration Project, WBMWD hopes to eventually forge ahead with a larger scale desalination facility, and a research and education center.

The outcome of this project will be to identify and mitigate issues that factor in the design and siting of a seawater desalination facility in an important and highly developed region of Southern California. All of the proposed tasks are required to develop a seawater desalination facility and are site specific. The cost of generating this information is small compared to the cost of building a seawater desalination facility and providing desalinated seawater, costs that are dominated in the long term by the electrical costs required to produce the water. However, these studies will ensure that the region's resources and identity are preserved while providing a water resource that promises sustainability and dependability long into the future.

### Project Information (DWR ID 035)

Principal Applicant: **San Diego County Water Authority**

Type of applicant (select one): ☒ (a) public entity, specify: **Wholesale Water Supplier**  
☐ (b) other, specify

Project Title: **Feasibility Study for Seawater Desalination at the San Onofre Nuclear Generating Station**

Funds requested (dollar amount): **\$250,000**

Applicant funds pledged (dollar amount): **\$550,000**

Total project costs (dollar amount): **\$800,000**

Grant awarded (dollar amount): **\$250,000**

Life of the project: **Oct. 1, 2005 - Jan. 1, 2007**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A**

State Assembly District where the project is to be conducted: **73<sup>rd</sup> Assembly District**

State Senate District where the project is to be conducted: **38<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **44<sup>th</sup> Congressional District**

County where the project is to be conducted: **San Diego**

Location of project (longitude and latitude): **117° 33' W / 33° 22' N**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

The goal of the Feasibility Study for Seawater Desalination at the San Onofre Nuclear Generating Station (SONGS) will be a detailed feasibility-level analysis of seawater desalination at SONGS and the production of a report documenting the findings: the development and evaluation of options for the production and delivery of desalinated seawater to the Water Authority and MWDOD (and other practical alternatives).

The objectives of the project will be to determine the constructability, cost effectiveness, and potential design constraints of a seawater desalination facility at SONGS. At the conclusion of the study, the feasibility study will develop the project to a point where environmental review and preliminary engineering of the desalination and conveyance facilities could begin.

### Project Information (DWR ID 040)

Principal Applicant: **City of San Diego**

Type of applicant (select one): ☒ (a) public entity, specify: **Municipality**  
☐ (b) other, specify

Project Title: **San Diego Formation Brackish G.W. Desalination Project - Phase II**

Funds requested (dollar amount): **\$249,700**

Applicant funds pledged (dollar amount): **\$250,300**

Total project costs (dollar amount): **\$500,000**

Grant awarded (dollar amount): **\$249,700**

Life of the project: **1.5 years**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A (6,000 AFY goal)**

State Assembly District where the project is to be conducted: **75<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **38<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **50<sup>th</sup> Congressional District**

County where the project is to be conducted: **San Diego**

Location of project (longitude and latitude): **117.07 W Longitude / 33.41 N Latitude**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

### Project Summary

The San Diego Formation Brackish Groundwater Desalination Project is to be accomplished in four phases and when completed is expected to produce 6,000 AFY. The feasibility study phase (Phase II) will evaluate the overall feasibility of implementing a groundwater desalination project using the San Diego Formation Aquifer including; hydrogeological assessment of the aquifer, drilling of monitoring wells, water quality monitoring, evaluation of treatment alternatives and site location for the full-scale facility.

The goals of the Feasibility Study are as follows:

- Assessment of the Hydrogeological condition of the aquifer
- Determination of the water quality of the Aquifer
- Evaluation of various treatment trains to achieve potable water quality
- Development of an interactive cost model to optimize the treatment and site selection.
- Identification of an appropriate site for the treatment facility

## Project Information (DWR ID 041)

Principal Applicant: **San Benito County Water District**

Type of applicant (select one): ☒ (a) public entity, specify: **Water District**  
☐ (b) other, specify

Project Title: **Pajaro Watershed Groundwater Desalination Feasibility Study**

Funds requested (dollar amount): **\$245,000**

Applicant funds pledged (dollar amount): **\$245,000**

Total project costs (dollar amount): **\$490,000**

Grant awarded (dollar amount): **\$245,000**

Life of the project: **18 months**

Estimated annual amount of water to be produced (in acre-feet) if applicable: **N/A (estimated 2,000-3,000 AFY when constructed)**

State Assembly District where the project is to be conducted: **28<sup>th</sup> Assembly District**

State Senate District where the project is to be conducted: **12<sup>th</sup> State Senate District**

Congressional district(s) where the project is to be conducted: **17<sup>th</sup> Congressional District**

County where the project is to be conducted: **San Benito**

Location of project (longitude and latitude): **36.8° N / 121.4° W**

Project related to: ☒ (a) Brackish water desalination feasibility study  
☐ (b) Seawater desalination feasibility study

## Project Summary

The San Benito County Water District (SBCWD) and the Santa Clara Valley Water District (SCVWD) joined to study water supply reliability improvements within the Pajaro River watershed. A sub-basin within the upper watershed, San Juan Basin, has poor quality groundwater *with* a significant portion of the San Juan Basin having total dissolved solids (TDS) in excess of 1,000 mg/L - unusable as a beneficial water supply. Through an integrated regional water management planning effort, these agencies have identified this brackish groundwater as a potential new M&I water source which could complement/offset to their CVP supply, as well as provide other benefits including: groundwater level management, reduce the need for water softeners in the service area, improve M&I effluent wastewater (recycled water) quality so it can be used as an alternative agricultural irrigation supply, thereby offsetting additional CVP demand, and provide an effluent management option for local agencies that relieves further salt loading on the basin.

The Feasibility Study would have five main goals:

- Evaluate the feasibility and cost-effectiveness of treating brackish groundwater for potable use.
- Assess different treatment technologies and brine management methods to provide the highest level of benefits possible to the Project partners.
- Quantify the offset of Central Valley Project (CVP) water due to the use of local groundwater as a new, alternative potable water source.
- Identify benefits and mechanisms to transfer and assure equitable benefits to local project partners as well as the State and the Bay-Delta system.
- Provide the basis for future demonstration and full-scale project implementation in the San Juan Basin to yield roughly 3,000 acre-feet per year of new water supply.